BC Calculus prompts

1. This semester we have explored the notion of a limit on many different levels; limits of sequences, limits of sequences of partial sums, improper integrals and Taylor series all involve the concept of a limit but in different ways (and at increasing levels of complexity). Discuss the different ways the notion of limit has been applied in these various mathematical contexts.

2. Some people enjoy learning advanced integration techniques such as trigonometric substitution; other people would be perfectly content using the TI-89 to obtain an anti-derivative. Is it a waste of time to learn a technique if we could obtain the same results with a machine? State your opinion, but back it up with good reasoning and specific examples drawn from your life experiences.

3. Taylor polynomials can only approximate the sine function or the natural exponential; no Taylor polynomial with its finite degree ever perfectly matches the function it approximates. Possibly this mirrors our own attempts to know ourselves and the world around us? Are our mental representations of ourselves and our world similar to Taylor polynomials? Is our conception of our world more like the closed form functions the “Taylors” strive to capture?

4. Recently, it has become popular to say to ourselves and to others “Try to live in the moment.” What does this mean to you? From the perspective of calculus, what does this mean? Do the ideas of calculus tell us that it is impossible to live in the moment so we should give up trying, or do they give us clues about how to attempt to approach an unattainable ideal?